WHAT IS CLAIMED IS:

1. A semiconductor device of a polysilicon gate electrode structure having three or more different Fermi levels, wherein:

a P type polysilicon having a lowest Fermi level is disposed on a first N type surface channel MOS transistor,

a first N type polysilicon having a highest Fermi level is disposed on a second N type surface channel MOS transistor, and

a second N type polysilicon having an intermediate Fermi level between the highest and the lowest Fermi levels and doped with both an N type impurity and a P type impurity is disposed on a P channel MOS transistor.

2. A semiconductor device according to claim 1, wherein:

the P channel MOS transistor and the second N type surface channel MOS transistor are disposed in a peripheral circuit while the first N type surface channel MOS transistor is disposed in a memory cell.

3. A semiconductor device according to claim 1, wherein:

the second N type polysilicon containing both the P type impurity and the N type impurity has impurity concentration distribution in which the concentration of at least the N type impurity at an upper surface of the second N type polysilicon is higher than an average concentration in the second N type polysilicon.

4. A method of producing a semiconductor device according to claim 1, wherein:

the second N type polysilicon containing both the P type impurity and the N type impurity is formed by doping at least the N type impurity by use of ion implantation.

5. A method of producing a semiconductor device according to claim 1, wherein:

the P type polysilicon, the first N type polysilicon ,and the second N type

polysilicon are separately formed by use of two masks.

6. A method of producing a semiconductor device according to claim 1, wherein:

the second N type polysilicon doped with both the N type impurity and the P type impurity is formed by simultaneously activating phosphorus and boron.

7. A method according to claim 6, wherein:

diffusion of boron towards a substrate is suppressed by simultaneously activating phosphorus and boron.

8. A semiconductor device including a DRAM having a gate electrode of a polymetal structure, comprising:

an N^+ gate PMOS containing both a P type impurity and an N type impurity and an N^+ gate NMOS which are disposed in a peripheral circuit, and

a P^+ gate NMOS containing a P type impurity alone which is disposed in a memory cell.